

Operation and Maintenance Manual

for

Kard

Hydraulic Trim Press

1-800-242-1253

Model TP30-4

Serial Number 97-2161

SERIAL NUMBER: 97-2161

STROKE: 14 IN.

MODEL: TP30-4

DAYLIGHT: 20 IN.

CUSTOMER: PCC THIXOFORMING

DATE SHIPPED: 6/97

OPTIONS: DEEM CONTROLS PROGRAMMABLE COUNTER
SIDE CORES
ROBOT INTERFACE
MID DIE STOP WITH UNLOADER INTERFACE

THESE ENGINEERING DRAWINGS ARE INCLUDED WITH YOUR MANUAL:

DRAWING #	REV.	DESCRIPTION
SP-013056-D	-	TRIM PRESS ASSEMBLY
DK012811	-	CYL. ASSY. - CUSTOMER COPY
DK012616	C	LOWER PLATEN
DK012620	C	MOVING PLATEN
SP-013055-D	-	HYDRAULIC SCHEMATIC
CK012593	A	PREFILL VALVE ASSY.
DK012599	C	SAFETY STOP ASSY.
SO 6164	-	ELECTRICAL SCHEMATIC

THESE ENGINEERING DRAWINGS ARE APPLICABLE TO YOUR MACHINE AND ARE ON FILE AT NATIONAL/KARD. REFER TO THESE WHEN COMMUNICATING WITH OUR CUSTOMER SERVICE REPRESENTATIVES.

DRAWING #	REV.	DESCRIPTION
CYLINDER		
BK012583	D	CYLINDER STUD
CK012580	C	ROD BUSHING
CK012585	C	BLIND HEAD
CK012586	E	PLATEN ATTACHMENT
DK012578	G	ROD HEAD
DK012579	C	ROD BUSHING HOUSING
DK012582	J	CYLINDER BARREL
DK012584	L	PISTON ROD
DK012587	B	CYL. ASSY. - ENG. COPY
CROWN, BASE, PLATENS AND TIE BARS		
AK012878	-	CAGE BRACE
BK012633	A	TIE BAR SPACER RING
CK012624	E	TIE BAR BUSHING ASSEMBLY
CK012656	B	PLATEN STOP ATTACHMENT
DK012919	A	PLATEN STOP SCREW
DK010321	J	CROWN

DRAWING #REV.**DESCRIPTION**

DK012677	H	TIE BAR
DK012616	C	LOWER PLATEN
DK012617	E	BASE WELDMENT
DK012620	C	MOVING PLATEN

ELECTRICAL

SO 6164	—	ELECTRICAL SCHEMATIC
---------	---	----------------------

GUARDS

AK012899	—	MAGNET MOUNTING BRACKET
AK012901	—	LATCH BRACKET
CK012900	—	SWITCH BRACKET
DK012889	—	LEFT FRONT CORNER
DK012890	—	LEFT SIDE DOOR
DK012891	A	SIDE DOOR PERFORATED PANEL
DK012892	A	REAR CORNER BRACE
DK012893	A	FRONT CORNER PERFORATED SHEET
DK012894	—	RIGHT FRONT CORNER
DK012895	—	RIGHT SIDE DOOR
DK012912	—	TRIM PRESS GUARD ASSEMBLY
DK012913	A	REAR DOOR

HYDRAULICS

SP-013055-D	—	HYDRAULIC ASSEMBLY
DK012917	—	MANIFOLD 3-D WIREFRAME
SP-013021-F	—	MANIFOLD

PREFILL VALVE

BK012590	C	MAIN POPPET
BK012591	D	PILOT PISTON
BK012592	A	PILOT END CAP
CK012588	B	BODY CAP
CK012593	A	PREFILL VALVE ASSY.
DK012212	F	HOUSING

SAFETY HAND PULLS

AK012669	A	HANDPULL PIVOT
AK012750	—	HANDPULL MOUNTING BLOCK
AK012826	—	SAFETY HANDPULL BEND DETAIL
BK012731	C	HANDPULL PLATE
CK012830	A	SAFETY SWITCH GUARD
CK012885	—	SAFETY HAND PULL

SAFETY STOP

BK012597	A	DOG
BK012598	A	MICRO ACTUATOR
BK012602	A	RETAINER PIN
BK012603	A	RETAINER PIN COVER PLATE
BK012679	—	TRANSDUCER MOUNTING BRACKET
CK012596	A	SAFETY STOP COVER
CK012601	I	SAFETY RATCHET BAR
CK012680	A	RATCHET BAR GUARD

DK012595	B	SAFETY STOP BODY
DK012599	C	SAFETY STOP ASSY.

MISCELLANEOUS

AK010630	-	SIDE CORE CONNECTION BLOCK
AK012668	-	LUBE MANIFOLD
BK012671	A	MANIFOLD STANDOFF
BK012767	A	MOTOR MOUNT - 15 H.P.
DK012406	B	RESERVOIR COVER - L.H.
DK012589	A	RESERVOIR COVER - R.H.
SP-013057-A	-	ELECTRICAL ENCLOSURE MOUNT
97-2161	-	IN-HOUSE ASSEMBLY DETAILS

Table of Contents

I. Introduction, Safety, and Installation	
Introduction.....	1
General Safety.....	3
Warning Label Reference	6
Oil Recommendation	7
Utilities Required.....	7
Installation.....	8
Filling the Reservoir	8
II. Controls and Features	
Control Overview.....	9
Programmable Controller.....	10
Single Cycle Safety.....	11
Timed Coincidental Circuit.....	11
Tank Venting Circuitry	11
Downspeed Valve (Platen Speed Adjustment)	11
Ratchet Safety Stop.....	12
Three Sided Guards.....	12
Heavy Duty Hand Pulls	13
Programmable Counter	13
III. Operation	
Jog Mode.....	18
Semi-Auto Mode, Without Unloader, Side Cores, Robot.....	18
Semi-Auto Mode, Using Unloader.....	18
Robot Mode	19
Unloader Option.....	19
Core Option.....	20
IV. Adjustments	
System and Up Relief Setting Procedures	21
Down Relief Setting Procedures.....	21
Decel Cushion Adjustment Procedures.....	22
V. Maintenance and Troubleshooting	
Overview	22
Preventative Maintenance Schedule	22
Troubleshooting	24
Suggested Spare Parts List.....	28
VI. PLC Program Listing	

Introduction

We are pleased to provide our maintenance and troubleshooting manual for your **KARD** Die Cast Trim Press built to the latest known safety standards and designs.

Several features which are important to a die cast trim press, and which are standard features with **KARD**, are:

1. **The KARD Air/Oil Hydraulic System** - Air over oil hydraulics was first introduced on the **KARD** trim press over 30 years ago, and has proven to be the most reliable, energy efficient hydraulic system in use today. By maintaining a positive head of air on the reservoir, the need for large pumps, high horsepower motors, regenerative hydraulic systems and substantial amounts of water for cooling the hydraulic oil is eliminated. Energy savings of 66% over competitive equipment is not unusual. Increased up-time and lower maintenance costs are also realized. These, along with many other features of the **KARD** press, provide the greatest return on investment and lower operating cost of any press in the industry today.
2. **Easy Set-up** - The adjustable platen stops provide fine thread adjustment for the platen stroke, and assure total prevention of die over-travel. The combination of the adjustable stroke and the adjustable platen stops provide the ultimate ease in set-up, flexibility in use, and positive die protection.
3. **Simple Maintenance** - The **KARD** hydraulic manifold design results in the minimum number of hydraulic lines and thus the fewest potential leak points. Press performance is so keenly related to the performance of the prefill valve that **KARD** designs and builds their own valve. The prefill valve provides a means of filling the cylinder rapidly on the downstroke, fast shifting to pressure stroke, smooth reversal at the end of the trim stroke, and a larger passage for the hydraulic fluid on the return stroke. The main frame involves no castings, but are solid steel, stress-relieved weldments. All of these features combine to make a strong, trouble-free, long-lasting machine. All hydraulics are mounted on the overhead of the press crown, keeping floor space to a minimum and the work area clear.
4. **Hydraulic System** - The unique **KARD** crown weldment is pressurized to 20 PSI to provide rapid approach speed. The hydraulic fluid is forced from the pressurized reservoir into the cylinder through the specially designed **KARD** prefill valve, providing rapid approach without cavitation, and thus permitting rapid pressure to build. Other advantages are less horsepower and smaller hydraulic systems requiring little or no water for cooling. The air supply has a filter, a lubricator, and a regulator to reduce the line pressure to 20 PSI .

One of the advantages of the **KARD** air-over-oil hydraulic system is a remarkably low noise level. Another inherent benefit of smooth operation is a great reduction in wear of the press components.

5. **Fail-Safe Operation** - Normal operation on all models is a standard semi-automatic cycle initiated by two safety hand pull bars. At the beginning of the cycle, the dies close rapidly under low pressure. Just prior to reaching the work, a specially designed deceleration valve is actuated by means of the programmable counter located on the front of the electrical enclosure. The programmable counter then determines at what point near the end of the stroke high pressure will be applied. In the event that a part is jammed in the die or the die is improperly positioned, pressure will not build up and the operator must release both safety hand pulls to return the ram to the top of the stroke.

Both safety hand pull bars must be pulled throughout the cycle until the part has been trimmed and the ram begins to return to the up-stop position. Releasing one hand pull stops the ram and holds it where it is. Releasing both hand pulls returns the ram to the top of the stroke. The hand pulls are counterbalanced and automatically drop between the base and moving platen, 3 inches from the top of the stroke, providing two positive stops.

An anti-tie down circuit is standard. This requires that both hand pulls must be initiated within ½ second of each other. If both are not initiated together, both must be released and the cycle re-initiated.

The **KARD** emergency shut-off switch stops electrical power to the machine and shuts off incoming air and vents the reservoir to the atmosphere to minimize fluid loss in the event of a leak.

A ram return pushbutton is provided to return the ram to the up position in the jog mode. This can also be used to jog the ram up during positioning and die set-up.

In addition to the heavy duty hand pulls, each machine is also equipped with a heavy duty safety ratchet bar as standard equipment. Remote lube points are provided for ease of lubrication.

KARD has pioneered many safety and protective devices for the trim press operator. We provide heavy duty three-sided guards as a standard feature. The three-sided guards will offer greater protection for the trim press operator and surrounding plant personnel. The guards are equipped with doors for easy die servicing or set-up.

Included as standard equipment are:

1. Heavy duty JIC electronics.
2. Heavy duty safety ratchet bar with remote lube points.
3. Single cycle safety.
4. Timed two-hand ram down hand pulls in jog and automatic modes.
5. Fully adjustable ram speed.
6. Hardened steel ram, ground and hard-chrome plated.
7. User-adjustable programmable counter for adjusting deceleration, pressure buildup, and pressure unload, up stop, and, when applicable, mid die stop.
8. Completely manifolded hydraulics.
9. Complete hydraulic filtration and cooling.
10. Heavy duty adjustable filtration and cooling.
11. Heavy duty adjustable platen stops.
12. Machine construction in compliance with OSHA standards as interpreted at the time of manufacture.
13. Heavy duty three-sided guards.
14. Seals compatible with petroleum base or water glycol fluid.
15. Jog ram-up pushbutton (manual operation).
16. Heavy duty safety hand-pulls with guard.
17. Process controller.

We provide the following:

One (1) straight ram, high speed Die Cast Trim Press self contained with heavy duty construction, exclusively designed for die cast trimming. Press can be operated in the die set-up and semi-automatic modes. A key selector switch is provided for this purpose. The press is complete, containing hydraulic oil reservoir (hydraulic oil not included), pump, motor, all necessary piping, valves, and hydraulic components. Press controls are conveniently positioned on the console for ease of set-up and operation. An hour meter is included as standard equipment.

General Safety Precautions

Before attempting to install and operate this equipment **BE SURE** that the responsible parties read and understand the maintenance and service manual. Set-up personnel and machine operators should be made familiar with cautionary and warning labels found on or near critical valves, gages, and controls before operating this equipment.

1. Before connecting this equipment to your plant power supply lines, **BE SURE** that supply current characteristics correspond to those shown on the nameplate located on the machine.

2. When connecting this equipment to plant power supply lines, **BE SURE** that supply lines are run from a suitably fused circuit breaker. Total recommended current load can be determined from the current characteristics located on the equipment nameplate.
3. When checking rotational direction of multi-phase motors, **BE SURE** that connections are tight and completely insulated before applying current. If it is necessary to reverse leads, be sure that the main power supply switch is off and cannot be turned on by accident.
4. When working in the electrical enclosure, **BE SURE** that the main disconnect switch is off and cannot be turned on by accident.
5. If air is involved in the operation of this equipment, do not exceed the maximum recommended air pressure specified. If plant air supply exceeds recommended pressure, **BE SURE** to install a dependable and accurate pressure regulator in the supply line ahead of the equipment.
6. If water is involved in the operation of this equipment, do not exceed maximum recommended water pressure specified. If plant water supply exceeds this pressure, **BE SURE** to install a dependable and accurate pressure regulator in the supply line ahead of the equipment.
7. Unless otherwise specified, **NEVER** install either an air or a water flow control valve on the exhaust side of this equipment. Any control valves should be installed between the supply and the equipment.
8. **NEVER** tighten leaking hydraulic fittings or hoses with the hydraulic system under pressure. When servicing solenoid operated hydraulic control valves, **NEVER** remove or remount valves unless the electrical power is off.
9. **NEVER** operate this equipment at tonnages, internal pressures, or temperatures in excess of those specified in the maintenance and service manual or shown on cautionary labels.
10. **BE SURE** to provide adequate clear and unobstructed work space around this machine. Avoid installing supply piping conduit, etc., in such a manner as to restrict safe access and working space for adjusting and servicing the equipment.
11. **BE SURE** that each operator is made completely familiar with all moving sections, opposing motions, and hazardous pinch areas of the equipment. Never operate where hands or clothing can be caught.

12. **BE SURE** that adequate illumination is provided to all operating and servicing areas of the equipment. Eliminate glare and shadow areas.
13. On equipment with exposed heated surfaces, **BE SURE** that each operator knows these danger areas and is provided with suitable protective clothing.
14. Adequate safety guards, safety gates, interlock control systems, and two (2) pushbutton controls are provided in hazardous areas for operator protection. **NEVER** operate this equipment with guards or safety gates removed or with the interlock systems either de-activated or bypassed in any way.
15. Safety check-out of safety guards, safety gates, interlock systems, or other safety devices should be performed at the start of each work shift and before production operation is resumed after equipment is serviced.
16. Warning and Caution labels are placed in hazardous locations for operator protection. Should these labels become displaced or illegible, they should be promptly replaced. Replacement labels can be ordered from **KARD** Corp. Service and Spare Parts Department.
17. **BE SURE** that any materials used in this equipment meet all safety requirements. Flammable or toxic solvents should **NEVER** be used in purging or cleaning this equipment. It is further cautioned that some solvents while non-combustible in liquid form are combustible and/or poisonous at elevated temperatures or as a gas or vapor. These solvents likewise should not be used.
18. **NEVER** use materials in this equipment unless you are sure the equipment is designed to safely handle them.
19. **WHENEVER IN DOUBT ABOUT COMPONENTS OR OPERATION OF THIS EQUIPMENT, CONTACT THE FACTORY FOR ASSISTANCE AND DIRECTION BEFORE OPERATING.**
20. Additional warning, danger, and caution information pertaining to safety is contained in other sections of this manual where applicable. No one should be permitted to operate this equipment without a thorough study of all sections of this manual and complete instructions by a qualified supervisor.
21. It is recommended that periodic review of the safety features and precautions outlined in this manual be made.

Warning Label Reference

All KARD trim presses are shipped with the following warning labels attached. Should they become difficult to read with wear, replacements are available from National/Kard Machinery. Refer to the drawing numbers and part numbers below when ordering replacements.

Drawing Number AK012433 - Warning nameplate as follows:

The electrical, hydraulic, and/or pneumatic circuits of this machine have been designed to provide interlocks and safety provisions to minimize risk of injury to operators and personnel working around the machine. Unauthorized alterations to these circuits may cause injury to personnel or damage to the equipment. Any alterations to the equipment should first be approved by the machine manufacturer.

Part Number K481004 - Danger nameplate as follows:

High Voltage. Disconnect and lock all power supplies before working in electrical enclosures or any other electrical equipment. This machine should be grounded as specified by a local and state code or by the National Electrical Code, as a minimum standard.

Part Number K481003 - Warning nameplate as follows:

High Pressure Oil. Do not tighten fittings or hoses without first shutting motor off.

Drawing Number AK012431 - Warning nameplate as follows:

1. The safety guards on this machine are placed here as an aid to safety. Do not operate this machine unless guards are in place.
2. After cycle initiation, always keep hands and personnel clear of all moving parts. In the event of an emergency, first depress the red mushroom button. Use caution during all manual set ups.
3. Throw all manual disconnect switch to the **OFF** position and lock in this position before working in the electrical enclosure.
4. Refer to instruction manual before operating this machine.

Drawing Number AK012432 - Warning nameplate as follows:

1. This machine should not be operated until the operating personnel have read the instruction manual and have been thoroughly instructed on safety and operation of this machine.

2. Any unusual machine motions or sounds should be reported to the operator's supervisor immediately.
3. Any subsequent purchaser of this machine should contact the manufacturer of the machine for safety information.

Oil Recommendation

This machine was factory tested using *water glycol*. **Use no other fluid without first contacting the factory.**

Reservoir Pressure - Warning - Maximum pressure not to exceed 20 PSI.

Notice to machine owners and maintenance personnel:

In that these machines are continually engineered for improvements, all spare parts should be ordered from **KARD Corp.** to ensure that the latest up-to-date replacement parts are furnished.

Approximate Hydraulic Fluid Capacities

<u>Trim Press Model</u>	<u>Capacity in Gallons</u>
TP20-4	25
TP30-4	35
TP30-1-4	40
TP30-1-5	44
TP40-1-4	40
TP50-4	50
TP-75	50

Utilities Required

Electric *For:* **230 Volts / 3 Phase / 60 Hertz**
 25 hp motor = 100 amps
 20 hp motor = 90 amps
 15 hp motor = 80 amps
 10 hp motor = 75 amps
 7.5 hp motor = 50 amps

For: **460 Volts / 3 Phase / 60 Hertz**
 25 hp motor = 70 amps
 20 hp motor = 60 amps
 15 hp motor = 45 amps
 10 hp motor = 40 amps
 7.5 hp motor = 25 amps

Water 3/4" N.P.T. inlet and outlet with globe valve on the inlet line and a flow control on the outlet to control water usage and oil temperature.

Note: Before connecting any water lines, put machine into production and monitor oil temperature. If oil temperature does not exceed 120°F, water is not required.

Air 1" N.P.T. @ 80 PSI minimum - 150 PSI maximum
1 CFM maximum required for press operation - air blow off excluded.

Note: For any customer installed equipment - consult the factory for recommendations and engineering information.

WARNING: In addition to the three phase power required for press operation, an earth ground must also be attached to the ground lug provided in the electrical panel to prevent damage to the electrical system and possible injury to the press operator or maintenance personnel.

Installation

These instructions are intended to provide maintenance and operating personnel with all the information needed to properly install, operate, and maintain this press for many years of satisfactory service. Although this press was primarily designed to be moved with a forklift truck, it can be safely lifted by a hoist and cable slings. Care should be taken to shim the press to compensate for any roughness in the floor on which the press is located. This machine can be easily transferred to new locations within your plant. However, each time it is relocated, care must be taken to shim it properly and lag or bolt it in place. Undue twisting or vibration can shorten the length of bearing and packing life.

Filling the Reservoir

Initial filling of the reservoir is done with the ram in the down position. However, final oil position level must be checked with the ram in the up position.

Open the two 1/8" N.P.T. air bleed valve located on the top of the cylinder piping and the 1/8" N.P.T. bleed plug on top of the prefill valve. Open the globe valve on the rear of the reservoir. Remove the 3/4" N.P.T. pipe plug located on the right front top surface of the reservoir. Fill the reservoir with the appropriate amount of hydraulic fluid, (see page 7). Initial oil level should be brought to approximately one (1) inch above the indicated oil level on the sight gage. Apply Teflon sealant on the 3/4" and 1/8" N.P.T. pipe plugs and reinstall them. **Do not over-tighten!** Close the 1/8" N.P.T. air bleed valve. Pull the *Power On / Emergency Off* switch which will allow air to enter the reservoir. Check the air gage on the front of the machine to assure the reservoir pressure is set at 20 PSI. Slowly open the 1/8" N.P.T. air bleed valve and remove all trapped air from the hydraulic

system. If the oil level drops below the recommended level with the ram in the fully up position, depress the *Power On / Emergency Off* switch which will automatically turn off the incoming air supply and vent air trapped in the tank. Remove the 3/4" N.P.T. pipe plug in the front of the reservoir and add additional oil as required. Pull the *Power On / Emergency Off* switch to apply air to the reservoir and open the 1/8" N.P.T. air bleed valve to remove all trapped air. Repeat the filling and air bleeding procedure as often as required until the oil is at the proper level.

Should the system be overfilled, remove the drain plug in the bottom of the oil filter and drain the required amount of oil. **BE SURE** the *Power On / Emergency Off* switch is depressed (OFF) before draining any oil.

Note: The globe valve on the rear of the reservoir must be in the full open position whenever the press is in operation. This valve is installed only to shut off the oil supply when changing the filter element.

Controls

Located on the right side of the press is an oil tight, NEMA 12, electrical enclosure. This contains the main disconnect, circuit breaker, motor starter, control circuit transformer, and the logic control circuitry. The circuit breaker disconnects all power to the machine. Access to the electrical panel cannot be made until the circuit breaker handle is in the off position.

The motor starter is a three phase overload magnetic type with the appropriate overloads for the motor. The control circuit transformer is sized to provide an adequate power supply to the valves and operating controls. The control transformer is protected by a fuse on the secondary side. The circuit breaker will trip automatically if a short circuit occurs on the high voltage line within the machine and if the customer provided disconnect or circuit breaker fails.

Located on the front of the electrical enclosure is the *Power On / Emergency Off* push/pull switch, *Motor Off / On* push/pull switch, *Key Operated Mode Selector* switch, *Ram Up Manual* pushbutton, *Safety Bar* indicator light, *Hour Meter*, the *Programmable Counter*, the *Core Manual On/Off* switch, the *Core In/Out* switch, the *Unload On/Off* switch, the *Unload Extend/Retract* switch, the *Core In lamp* and the *Core Out lamp*.

DANGER - **Never work on the electrical system without first disconnecting and locking out the main power supply.**

Power On / Emergency Off (pull on / push off) - Pulling this switch provides power to the control circuit, opens the air inlet valve, and closes the tank vent valve. Pushing the switch disconnects all power to the control circuit, closes the air inlet

valve, and opens the tank vent valve. When in the ON position, a red indicator lamp in the switch operator is illuminated.

Motor On / Off (pull on / push off) - Pulling this switch when the *Power On / Emergency Off* push/pull switch is in the ON position allows the motor to start. Pushing the switch will stop the motor. When in the ON position, an amber indicator lamp in the switch operator is illuminated.

Mode Selector (key operated) - *Jog, Semi-auto modes* - The mode selector switch must be in the *Jog* mode before the motor can be started. While in the *Jog* mode, the press will close only at decelerated speed and will not develop high pressure. The ram will not return unless the *Ram Up Manual* pushbutton switch is depressed. This mode is to be used for press start-up and any die set-up performed. In the *Semi-auto* mode, the press will perform its normal functions, namely high speed close, deceleration, pressure, unload, and auto-return when the hand pulls are released.

Ram Up Manual (pushbutton) - This switch provides a means of returning the ram to the up stop setting while in *Jog* mode.

Safety Bar Indicator (light) - This light is illuminated when the safety dog is retracted (out and clear of the ratchet bar).

Hour Meter - This device records the total number of hours the press has been operated. This is provided so preventive maintenance can be scheduled at recommended intervals.

Programmable Counter - A detailed description begins on page 13 of this manual.

Core Manual On/Off, Core In/Out, Core In/Core Out Lamps - A description of the Core Operation begins on page 18.

Unloader Option - A description of this option begins on page 17.

Programmable Controller

Your **KARD** press is equipped with a state-of-the-art programmable controller manufactured by Allen Bradley Corp. The unit has been thoroughly tested at the factory and the proper program installed to perform the functions required to the trim castings as described in our quotation. Tamper-proof seals have been installed at the factory over the program terminal and EEPROM controller. There is no need to access either of these items.

DO NOT ATTEMPT TO CHANGE OR ALTER THE PROGRAM, AS SERIOUS INJURY TO MACHINE OPERATORS OR MACHINE DAMAGE COULD

OCCUR! CONSULT THE MANUAL PROVIDED WITH THE MACHINE FOR TROUBLE-SHOOTING INFORMATION. CONTACT THE FACTORY FOR ASSISTANCE IF THERE SHOULD BE ANY FAILURE WITH THE PROCESS CONTROLLER.

KARD CORPORATION DISCLAIMS ANY RESPONSIBILITY OR LIABILITY FOR ANY DAMAGE OR INJURY SUSTAINED IF THE PROGRAMMABLE CONTROLLER IS TAMPERED WITH OR ALTERED IN ANY MANNER.

Single Cycle Safety

The *single cycle safety* feature incorporated into this machine operates in the *Semi-Automatic* mode only. This feature permits only one cycle initiation. If the cycle is not completed, the ram must be returned to the top of its stroke and the cycle must be re-initiated before the press will move to the bottom of the stroke.

Timed Coincidental Pushbutton Circuit

For cycle initiation and electrical logic circuit (anti-tiedown) insures that both heavy duty hand pulls must be pulled together within the preset time of the time delay. If the heavy duty hand pulls are not pulled as described above, they must be released and the cycle re-initiated. The time delay is set to 1/2 second. The coincidental circuit is operational in the *jog* and *semi-automatic* modes.

Note: The operator should check this feature for proper operation at the start of each shift, after each break period, or when restarting the machine from any shut-down.

Tank Venting Circuitry

This machine incorporates two (2), 2-way air valves and control circuitry to vent the tank automatically whenever the *Power On / Emergency Off* push/pull switch is pushed (off). A normally closed air valve is on the top of the hydraulic oil reservoir next to the air pressure relief valve. Pushing the *Power On / Emergency Off* push/pull switch returns the valves to their normal states, thus shutting off the air to the machine and opening the tank vent. Because the tank is vented with the power switch pushed off, machine start-up requires that the operator wait momentarily after pulling on the power switch before pulling on the motor start switch. This is to allow the tank to pressurize to prevent pump cavitation.

Downspeed

The down speed valve is located on the bottom of the hydraulic manifold facing the press operator. The down speed valve is used to control the fast closing speed of the press.

The down speed valve should be adjusted to obtain smooth operation of rapid approach, deceleration, and part trim with little shock to the press.

Ratchet Safety Stop

Your new **KARD** press is equipped with a ratchet safety stop. Upon operation of the heavy duty hand pulls, the safety dog is withdrawn by an air operated cylinder. When the safety dog is completely withdrawn, the "down" circuit is completed through the safety micro-switch, and the platen moves down. The safety logic circuit insures that the dog must engage the safety bar after each down cycle. If the safety dog should stick open, the machine cannot be recycled until the dog is freed. When it is necessary to change the press daylight, be sure to check the position of the safety dog in relation to the ratchet bar when adjustments are complete.

The safety dog must rest in position midway between the slots on the safety ratchet bar and not be engaged into any of the slots when the platen is at the top of the stroke (up limit preset distance value, P4).

The safety dog engages the ratchet bar by means of a spring loaded piston for positive return, whenever the two heavy duty safety hand pulls are not engaged. For ease of lubrication, remote lube points are provided on the front of the machine. This should be lubed on a weekly basis with a medium-weight grease.

CAUTION: The safety bar indicator light is located on the front of the remote control panel. It tells the operator if the ratchet bar is working properly. When the safety dog is engaged, the light is off and when the dog is disengaged, the light is on. Whenever the heavy duty safety hand pull signal is not initiated, the light should be out.

Three Sided Guard

This machine incorporates a three-sided guard for operator safety as well as preventing unauthorized or accidental access from the rear or sides of the press. The guard is of a fixed type. Opening either the rear or side doors permits easy access to the die area. Under normal circumstances, removal of the guard should not be necessary. All doors are interconnected to safety magnetic proximity switches. Opening any door prohibits operation of the machine in the semi-automatic mode. **Never defeat, bypass or otherwise disable these magnetic switches. Serious injury may result. Replacement switches and magnets are available from National/Kard Machinery.**

A guard is provided to cover the clamp down switches that are operated by the heavy duty hand pulls. This is to prevent accidental initiation of the clamp down switches.

A ratchet bar guard is also provided to prevent injury to personnel as the platen and ratchet bar move up and down during press cycle.

Never operate this machine with any safety guard removed.

WARNING: While certain guards are bolted to the machine, they are considered to be "fixed" guards and are not to be removed any time the press is being operated in any operational mode. They are intended to be removed only for maintenance and must be re-installed immediately after repairs are made and before the machine is operated.

Never modify the guards in any manner without contacting the factory for specific modification instructions and drawings and any safety updates that may apply.

Heavy Duty Hand Pulls

Your machine is equipped with heavy-duty safety hand pulls which drop under the moving platen as it returns to the up-stop setting and prevents the platen from closing until the hand pulls are pulled free of the moving platen.

In order to close the press, it is necessary to pull both bars back to their stop position. This action initiates the press close circuit. To return the ram, the operator must release both hand pulls which will fall against the moving platen initiating the ram-up circuit. When the platen returns past the hand pulls, they drop underneath the moving platen, blocking downward movement of the ram.

CAUTION: The safety hand pulls should be checked several times during each shift for proper operation. When released by the operator, they should drop against the moving platen, or into the die area, when the ram is up, without any assistance from the operator. If they do not move freely or require assistance from the operator to move into the die area, stop the machine and correct the problem immediately. Little or no effort is required to actuate a cycle when the safety pulls are working properly. **Do not pull with unnecessary force!**

Note: The hand pulls are provided with a travel limit adjustment which is factory set to prevent damage to the actuator buttons. These are factory set and should never require adjustment. However, should adjustment be required, remove hand pull safety guard to gain access to the travel limit adjustment screw.

NEVER OPERATE THE MACHINE WITH THE HAND PULL SAFETY GUARD REMOVED!

Programmable Counter

Description: The Deem Controls Line Set One Programmable Limit Switch, (Programmable Counter), located on the front of the electrical enclosure, is a stand-alone, microprocessor-controlled device. On your KARD trim press, it is used as a controller for the Tempesonics LP Start-Stop Linear Displacement Transducer, (LDT), located on the

rear of the machine behind the electrical enclosure. The Programmable Counter operates on 115 VAC while the LDT operates on 24 VDC.

With the counter in the "RUN" mode, and the moving platen at the top of its stroke, the counter displays the distance from the factory programmed ZERO point. The value shown should be between "0.00" and "0.60", (see FIG. 1, previous page). This distance is the factory programmed UP STOP position in inches. Then, as the platen travels down and up through the cycle, the counter displays the distance that the moving platen has moved from the ZERO point. When the moving platen returns to the top of the stroke, the counter again shows to the up stop preset value, and the process is repeated. By changing the program presets in the counter, the set-up person can specify the point in the cycle, within 0.01", at which the deceleration, high pressure buildup, pressure unload and mid die stop, (when applicable), are encountered. The counter can be set to display these positions in inches or in millimeters. It is configured at our facility to read in **inches** unless otherwise specified.

Deceleration Preset, (P1): The purpose of the deceleration preset is to slow down the moving platen as it approaches the part to be trimmed, and to provide a smooth cutting stroke and a minimum of break-through shock. The deceleration valve is built into the manifold block, and is actuated by a hydraulic solenoid valve.

CAUTION: DO NOT BYPASS THE DECELERATION AS DIE DAMAGE OR EXCESSIVE PRESS WEAR MAY OCCUR.

Note: As the downspeed of the moving platen is increased, it may become necessary to program the deceleration to begin sooner to allow sufficient time for the machine to shift into decel mode. (I.E., To begin decel at 10.0 inches, it may be necessary to program the deceleration preset distance value, [P1], to 5.0 or 6.0 inches.

Pressure Preset, (P2): Correct adjustment of the pressure and unload preset distance values is the key to press safety and efficiency. The pressure preset distance value is a die protection device. The preset value should be set so that if the work is properly positioned in the die, the pressure will come on precisely at the point of trim. If the work is improperly positioned, the pressure will not come on, and the maximum force that can be exerted by the press is approximately 500 lbs., plus the weight and inertia of the moving platen. Therefore, the pressure preset value setting prevents full tonnage from being exerted on an improperly located piece of work, saving both the work and dies from damage.

Unload Preset Adjustment, (P3): The unload preset should be set just below the work completion area and above any mechanical position stops. With any mechanical stops adjusted to a position to keep the dies from bottoming, it is obvious that the only time the press will actually be working with high pressure is when it contacts the work and forces through. If the unload preset distance value is set too high, the ram will then follow

through to any mechanical stops at full tonnage. The fact that both hands must be kept on both controls until the power is on means that it is impossible to get hands near the work until the die is closed. If one pull handle is released, the moving platen stops. If both handles are released, the moving platen will return to the top of the stroke. Although the press is set for the full rated tonnage, it is not necessary to change the setting for an particular operation as the tonnage will only build up to the amount needed to do the work.

CAUTION: It is imperative that the unload preset be adjusted properly, especially in the side core mode, as this preset signals the core cylinders to activate and complete the side trimming operation. Failure to receive this signal will result in the machine not completing its cycle and shutting the work cell down.

Mid Die Stop Preset, (P6): On machines with optional top part knockout and part unloader, the Programmable Counter detects that the mid die stop preset distance has been reached during the up stroke. The upward travel of the ram is then stopped to allow the unloader tray to enter the die area. When the unloader tray is fully in, a signal is sent to the press to allow it to complete its upward travel and eject the parts from the upper half of the die. The mid die stop preset value must be adjusted to allow sufficient clearance to allow the unloader tray to enter the die area without bumping the trim die, but close enough that the parts, when ejected from the upper half of the die, do not fall too far enough that part damage can occur.

Up Stop Setting (P4): The up stop setting is factory-set at maximum daylight **DO NOT ATTEMPT TO ADJUST THE UP STOP. DAMAGE OR INJURY MAY RESULT.** Leave this setting at the factory setting.

Adjusting Presets:

Using the four button keypad, the setup person can adjust these parameters:

- Preset Distance Values
- Display Units, (Inches or Millimeters)

The programmed values are stored in a non-volatile EEPROM memory, which will retain them indefinitely, even in the absence of power. As stated earlier, while the counter is in the "RUN" mode, the display reads the position of the moving platen. When the counter is "CHANGE" mode, the display shows the current values of the stored programmable parameters.

The following red LED indicator lights are located around the display:

- **8 Programmable Outputs, (Presets)** - When ON in the "RUN" mode, these indicate the activation of their respective distance set points. When ON in the "CHANGE"

- mode, they indicate the output to be programmed.
- **ZERO** - used to toggle between and Standard or Metric mode.
 - **RUN** - When lit, the counter is in "RUN" mode. When extinguished, it is in "CHANGE" mode.
 - **MM** - Metric Display Mode
 - **IN** - Standard, (Inches) Display Mode

To Adjust Presets:

1. With the machine running, turn the Mode Selector Switch to the JOG position and set the downspeed valve to 1/4 turn open.

IMPORTANT: DO NOT ATTEMPT TO ADJUST PRESETS UNLESS THE KEY-OPERATED MODE SELECTOR SWITCH IS IN THE JOG POSITION.

2. With the moving platen fully raised, the counter display shows the distance of the ram from the ZERO point, (the factory-determined upper travel limit). This value should be between "0.00" and "0.60", (See FIG. 1). This is the factory-programmed UP STOP position in inches. DO NOT ATTEMPT TO ADJUST THE ZERO POINT OR THE UP STOP POSITION.
3. Pull both hand pulls to move the moving platen down to the point in the cycle at which you want the deceleration to begin.
4. Note the display. This is the value that you will enter as the first preset, (P1), in step 6.
5. Continue jogging the machine thru the cycle. Note the counter reading as the moving platen reaches the points at which you wish to begin high pressure trimming, unload, mid die stop, (if applicable).
6. In order to access the programming of the Line Set One, the CHANGE key must be pressed for 3 seconds. This brings the counter into change mode and the RUN light turns off.
7. The first programmable output light will be on and the display shows the value of the first preset distance. This is the DECEL preset, (P1). At this point you may scroll through the remaining presets by pushing the LEFT or RIGHT key. The corresponding LED indicator will light, and the display shows the value for each point.
8. Scroll to the set point you wish to change. DO NOT SELECT "ZERO" OR THE UP STOP PRESET. Enter The INDIVIDUAL CHANGE MODE by briefly pressing the "CHANGE"
9. The selected set point light begins flashing. Using the **LEFT / INCREASE** or **RIGHT INCREASE** key to increase or decrease value shown on the display until the desired value, (determined in step 4), is reached.
10. Push the "CHANGE" key briefly until the set point stops flashing. This exits the Individual Change Mode and registers your selection in temporary memory.
11. Repeat this procedure for the other presets.
12. To permanently save your settings and exit to "RUN" mode, press the "CHANGE"

key for 3 seconds.

Note: Pressing the "UNDO" key while in the CHANGE mode will return to the previously programmed values and discard your changes. This option is no longer available once you return to the RUN mode.

For Machines Without Optional Top Part Knockout and Parts Unloader:

P1 = DECELERATION
P2 = HIGH PRESSURE, (TRIM)
P3 = UNLOAD
P4 = UP STOP (**DO NOT ADJUST**)

For Machines With Optional Top Part Knockout and Parts Unloader:

P1 = DECELERATION
P2 = HIGH PRESSURE, (TRIM)
P3 = UNLOAD
P4 = UP STOP (**DO NOT ADJUST**)
P6 = MID DIE STOP

Note: Although the programmable counter itself is capable of recalling up to eight preset distance values, only four are used on the standard KARD trim press and five are used on trim presses with optional mid die stop. The unused presets have no effect on the operation of the press and may remain adjusted to any value.

Operation

BEFORE STARTING THE PRESS, BE SURE THE HYDRAULIC RESERVOIR IS PROPERLY FILLED WITH OIL, THE GATE VALVE TO THE OIL FILTER IS OPEN, AND THE DOWN SPEED VALVE IS OPEN ONLY 1/4 TURN!

Turn the *Mode Selector* switch to JOG and pull the *Power On / Emergency Off* switch. Check the reservoir air pressure indicated on the air pressure gage. Pressure should be 20 PSI. Be sure the gate valve between the reservoir and the hydraulic filter is open.

The check motor rotation, pull the *Motor Start* switch, then immediately push the *Motor On / Off* push/pull switch to OFF to stop the motor. While executing the above operation, have an observer check the rotation of the motor shaft. For correct rotation, the shaft must turn in the direction the arrow on the pump and/or motor housing indicates. If the rotation is in the opposite direction, shut off the power at the customer provided external disconnect (not the disconnect in the press), and reverse any two of the three power lines. After the correct rotation is determined, restart the motor. With the motor operating, press the *Ram Up Manual* pushbutton and the moving platen will rise to the

top of the stroke. Be sure that the oil in the reservoir is at its designated level. The final oil level check must be done with the ram in a full up position.

Jog Mode

With the *Mode Selector* switch in the JOG mode, and the down speed valve 1/4 turn open, pull both hand pulls and the platen will close at deceleration speed, and continue to close until it meets resistance. No high pressure (trim force) will develop while the *Mode Selector* switch is in the JOG position. Push the *Ram Up Manual* pushbutton to raise the platen.

Semi-Auto Operation, Without Robot, Cores, or Unloader

Turn the *Mode Selector* switch to the SEMI-AUTO position, and the unloader switch to the OFF position. (*Note: open the down speed valve on 1/4 turn initially to insure the platen speed is not excessive and cause die damage*). Actuate both Opto-Touch pushbuttons and the platen will close at the rapid approach speed (down speed valve setting), then decelerate as the decel preset distance is reached and is detected by the programmable counter, and develop high pressure (trim force) as the pressure preset distance is reached. High pressure will not register on the system pressure gage as no work is being performed until the part is actually trimmed. The press continues its downward travel until reaching the unload preset distance, (the Opto-Touch pushbuttons may now be released). Trim force (the effort to trim the casting) will register on the system pressure gage, as will the ram up pressure (pressure required to raise the ram). Releasing both pushbuttons before the unload preset is reached will return the platen to the top of the stroke.

Semi-Auto Mode, While Using an Unloader

Turn the *Mode Selector* switch to the SEMI-AUTO position and the unloader selector switch to the ON position. (*Note: open the down speed valve on 1/4 turn initially to insure the platen speed is not excessive and cause die damage*). Actuate both Opto-Touch pushbuttons and the platen will close at the rapid approach speed (down speed valve setting), then decelerate as the decel preset distance is reached and is detected by the programmable counter, and develop high pressure (trim force) as the pressure preset distance is reached. High pressure will not register on the system pressure gage as no work is being performed until the part is actually trimmed. The press continues its downward travel until reaching the unload preset distance, (the Opto-Touch pushbuttons may now be released). Trim force (the effort to trim the casting) will register on the system pressure gage, as will the ram up pressure (pressure required to raise the ram). Releasing both pushbuttons before the unload preset is reached will return the platen to the top of the stroke. During the upstroke, the ram will pause at the mid diestop preset position until the press receives the "unloader in" signal. The ram then resumes it's

upward travel, ejecting the castings, which drop into the unloader tray. The press may be recycled after reaching the up stop preset and receiving the “unloader clear” signal.

Robot Mode

Your trim press incorporates in the electrical logic all of the operation controls for operating a robot. In the robot mode, both safety hand pulls must be pulled before any press movement can occur. This can be accomplished by blocking the safety hand pulls with the blocks provided. **Do not, at any time, remove the safety hand pulls.** In robot mode, the trim press will not function without a signal from the robot. Before turning the selector switch to *Robot Mode*, the platen must be in the up-stop position. This signal, along with the robot clear signal, must toggle from state to state every cycle. This is to insure that the robot is cycling and not just tied down.

Unloader Option

Your trim press incorporates in the electrical logic all of the operational controls for operating an unloader. The unloader is mounted to the press base by a mounting plate and heavy duty swing bracket which allows the unloader to be swung clear of the rear of the press for ease of press maintenance, die change, or servicing.

A selector switch is provided on the master control panel for unloader selection. In the OFF position, the unloader returns to its rear position, contacting the limit switch and permits the press to function in the normal manner. In the manual mode (used for die set-up and unloader adjustment), the unloader will only operate when the ram is in the up position and the *Unloader In Manual* pushbutton is depressed. When the pushbutton is released, the unloader tray will retract. In the auto position, the unloader will function automatically with the trim press.

The hydraulic or pneumatic system used to operate the unloader includes an FRL unit, a 4-way valve, and speed controls for the speed of the unloader tray. These are factory set, and most probably will not need field adjustment. The pressure regulator for the unloader is factory set and should always be set as low as possible to minimize the shock when the unloader tray is actuated. The lubricator should *always* be filled with an appropriate lubricant. Failure to keep the lubricator filled will result in reduced operating life of all components in the unloader circuit.

Note: The unloader back limit switch must be activated before any press movement will occur (either down or up).

For additional information on the unloader, consult National/Kard Machinery.

Core Operation

With the core selector switch in the ON position, and the *Mode Selector* switch in the JOG position, core movement is possible. The *Core In Manual* selector switch may be activated. This is a spring-return-to-center selector switch. Any time the selector switch is released, it returns to the center position and the core cylinders will stop at their current position. When activated, the core cylinder will extend and remain extended as long as the selector switch is held. Releasing the selector switch stops the core cylinder (*Note: high pressure is exerted on the core cylinder when in the JOG mode*). Limit switches must be installed to be actuated when the core cylinder is extended or retracted. These switches must be installed for the side core to operate. The *Core Out* indicator glows when the core cylinder is clear off the die. The *Core In* indicator glows when the core cylinder is extended into the die area to its proper stroke. A press cycle cannot be actuated until the core cylinder is retracted and the core out limit switch is engaged.

Note: For proper operation, die protection, and operator safety, a core in and core out limit switch must be installed on each cylinder.

When the *Mode Selector* switch is in the SEMI-AUTO position and the *Core Selector* switch is in the ON position, the core cylinders will function automatically. Activating the clamp down hand pulls will allow the press to close. When the unload cam is activated, the core cylinders will extend until the core-in limit switch is activated. During this time, the press and core cylinders are under full tonnage. When the core-in limit switch is activated, the core cylinders reverse direction until the core-out limit switch is activated.

Activating the core-out limit switch will disengage all safeties and reduce both press and core tonnage. Releasing both hand pulls will return the platen to the top of the stroke (up stop setting).

Note: When the core cylinders are activated in the SEMI-AUTO mode, the operator may **not** release the hand pulls until the core cycle is complete. Releasing the hand pulls will stop the core cylinders in either the in or out movement, and drop all pressure to the clamp and core system. To restart the core movement to complete the cycle, both hand pulls must be re-initiated. The press will stay under tonnage until the core cycle is complete and core cylinders are fully retracted.

Sequence of Operation: Engage both hand pulls. Press will close in high speed, decel, trim part, and activate the core cycle. The core cylinders will extend. When all core cylinders are extended (and core limit switches are activated) the core cylinders will automatically reverse. When the core cylinders are fully retracted, the core-out limit indicator lamp will light and the clamp and core pressure will automatically reduce (*Note: both hand pulls must remain engaged throughout this entire sequence*). The hand pulls

can then be released and the clamp will return to the top of the stroke (up stop setting) and reset for the next cycle.

WARNING - Upon releasing the hand pulls, the operator must keep hands and objects away from the press, as the press will return automatically when the core-back limit switches are engaged.

Consult the factory to use this press without the core system.

System Relief and Up Relief

The system and up relief valves are used to prevent over-pressurizing the hydraulic system. These pressures are factory set at the rated pressure stamped on the **KARD** nameplate on the front of the press and should not require any adjustment. However, if the pressures must be adjusted, the following procedure must be carefully followed:

Do not attempt to adjust the system relief valve without a die in the machine as damage to the press may occur.

1. Jog the machine to the top of the stroke.
2. Remove the caps on the system relief valve, (labeled #5 on the machine), and on the up relief valve, (#23), exposing the adjusting screws.
3. Turn the adjusting screw on the up relief valve, #23, clockwise 4 turns.
4. Using a pin, manually push the up solenoid #7 (UP SOLENOID #7) to shift the valve.
5. Note the pressure on the gauge and adjust the system pressure to 2500 psi by turning the adjusting screw on valve #5.
6. Release pin to allow solenoid valve to return.
7. Replace cap on system relief.
8. Again, using the pin to manually shift the up solenoid valve, adjust the up relief to 2000PSI using the same procedure for valve #23.

Down Relief

The function of the down relief system is to prevent high pressure build up in the hydraulic circuit. The down relief pressure is factory set at 2300 PSI and should not require re- adjustment. However, if down relief valve adjustment is necessary, the following procedure must be followed:

1. Jog press to the bottom of the stroke until the moving platen is resting against the mechanical stops.
2. Using a pin, manually push the down solenoid, (DOWN SOLENOID #7), to shift the valve.
3. Note the pressure reading on the gauge and adjust to 2300 PSI by adjusting the down relief valve (#6).

Decel Cushion

The purpose of the decel cushion is to facilitate a smooth transition from the rapid closing of the ram to the deceleration. It is adjusted at the factory and will likely not need adjustment. If it becomes necessary to adjust, (i.e. because of heavy tooling), the adjustment is located on the side of the manifold and is stamped "RV4". Turning the adjusting screw clockwise results in a higher relief setting. Operating with this setting too high makes the transition from fast to decel too sudden, resulting in a loud "thud". If these circumstances are encountered, turn the adjustment screw counter-clockwise until the transition to decel becomes smooth. **Turning the adjusting screw too far counter-clockwise eliminates the decel.**

Maintenance

The **KARD** Trim Press is designed to give years of satisfactory service with a reasonable amount of preventive maintenance. The press should be kept clean and free of scrap. The hydraulic system is entirely enclosed to seal out dirt and contaminants, thus adding years to the life of the press. Remember: 95% of all hydraulic trouble can be traced to dirty or contaminated oil, or lack of ordinary preventive maintenance! A filter is supplied to help keep the hydraulic oil clean. See the recommended oil list on page 7 for the proper oil. Drain water traps in the incoming air line regularly.

The electric system requires little maintenance. The electrical enclosure door must be kept closed and all other electrical boxes must have the covers in place. Keep all enclosures clean and free of dirt and oil. Electrical connections must be kept clean and oil-tight. (See Preventive Maintenance Schedule.)

Mechanical components of the press should be kept clean and properly lubricated. (See Preventive Maintenance Schedule.)

Preventive Maintenance Schedule

Daily:

1. At the beginning of each shift check for proper operation of the:
 - a. **Ratchet Bar** - Be sure dog is properly engaging the ratchet teeth.
 - b. **Heavy Duty Safety Hand Pulls** - Check for smooth operation and that they fully return to an upright position when released. During operation, the operator must keep the contact area of the hand pulls free of scrap.
 - c. **Anti-Tiedown** - Pull each hand pull individually. No action of the ram should be seen. Pull the hand pulls in sequence, approximately one (1) second apart. No action of the ram should be seen. Pull both together (within 1/2 second) and the ram should close. Releasing either hand pull should stop the ram. Releasing both hand pulls should return the ram to its top stop (Except in MANUAL mode the *Ram Up Manual* pushbutton is

- required to return the ram to the top stop).
- d. Check the trim die for proper tightness and alignment.
 - e. Be sure safety guards are installed on the press. (Three-sided platen guards, hand pull guard, and safety ratchet guard.)
 - f. Check for proper setting of the platen stops.
 - g. Observe ram for drift. If any is observed, notify maintenance immediately for repair and/or correction of the problem.

Weekly:

1. Once each week the machine should be checked as follows:
 - a. Drain all water from the filter on the air inlet line.
 - b. Check lubricator in air line and fill to the recommended level.
 - c. Check oil level in reservoir and fill as required to the recommended level.
 - d. Grease the tie bar bushings (zerk fittings are provided) with an acceptable lubricant.
 - e. Grease the safety ratchet bar (zerk fittings are provided) with an acceptable lubricant.
 - f. Bleed air from the clamp cylinder piping at the top of the press using the 1/8 inch bleed valve provided.

Monthly:

1. Check the following:
 - a. Tie bar nuts are properly torqued.
 - b. All guards are in place and not damaged.
 - c. Inspect the safety ratchet for wear - replace as required.
 - d. Inspect the electrical enclosure for loose wires or components.

Quarterly:

1. Replace the following:
 - a. Oil filter element.
2. Clean the following:
 - a. Air filter bowl.
 - b. Lubricator bowl.

Annually:

1. Drain the oil reservoir, clean the reservoir thoroughly, and replace the hydraulic oil.

CAUTION: Do not leave any rags or cleaning materials in the reservoir. Any foreign material left in the reservoir will enter

the hydraulic system and cause a malfunction!

2. Grease electric motor per manufacturer's instructions.
3. Consideration should be given to replacing the cylinder seals when cleaning the reservoir. If the machine has been operating on water glycol fluid and running for 2 or more shifts per day, it would be advisable to replace the seals when cleaning the reservoir. This will eliminate future down time.

If the machine should malfunction or is suspected of a malfunction at any time, it should be shut down immediately. Notify the maintenance department to take the appropriate action. Under no circumstances should the operator continue to operate the machine.

Should any assistance or additional information be required, please contact our Service Department between 8:00 a.m. and 4:30 p.m. (Eastern), Monday thru Friday.

Troubleshooting

Pump Excessively Hot or Noisy:

1. Check oil level in reservoir and add oil if necessary. Add oil and measure oil level only when the ram is in the up position. Insufficient oil causes cavitation, loss of pressure, heat, and noise.
2. Check air pressure gauge. Keep air pressure at 20 PSI. Too little air pressure may cause cavitation. Excessive pressure causes pump seal failure.
3. Check maximum pressure on the hydraulic gauge. **DO NOT EXCEED THE PRESSURE RATING ON THE KARD NAMEPLATE LOCATED ON THE FRONT OF THE MACHINE!** Excessive pressure may damage the pump, valves, the press, and/or the cylinder and bushings.
4. Suction filter may be clogged. Replace the cartridge or entire filter if necessary. *Note: use type C-68 element for petroleum based fluid, and type C-69 element for water glycol fluid.*
5. When checking the hydraulic gauge, if pressure fails to reach the desired level, adjust the system relief valve (see Operation Checkout). If you are unable to get more than 1000 PSI pressure reading, it generally indicates that the pump is worn out. Remove the front plate from the pump and check the condition of the vanes and inner ring surface. A rough or scored surface would indicate that the pump cartridge needs replacing.
6. Check the tank shut-off valve. Be sure it is open at all times.

Ram Won't Move Down:

If the ram does not move down when the hand pulls are activated, check to see that the down by gravity valve is actuating when the hand pulls are pulled. Also check the limit switch LS5 (safety ratchet bar) and make sure it is energizing. All logic functions must be completed before Solenoid C (ram down by gravity) valve can be energized allowing the press to close.

Be sure the tie bars are greased thoroughly. Check tie bar nuts to be sure they are tight. Be sure the adjustable platen stops for the moving platen are exactly the same height above the press bed. Uneven platen stops will cause tilting of the moving platen under full tonnage. Check pilot pressure to the directional control valve. A maximum of 65 PSI is required to shift the 4-way valve.

Ram Moves Down Slowly:

If the press operates properly, but the ram moves down slowly, be sure the down speed valve is open. Also check to see if the down by gravity valve is actuating properly.

Ram Moves Up and Down Properly, but Fails to Develop Pressure at the Bottom of the Stroke:

1. Check the preset distance values in the programmable counter carefully. The pressure preset should be adjusted to about 0.10" to 0.40" before actual trimming begins. If the pressure preset value is set greater than or equal to the unload preset, no pressure will be applied to the work.
2. Visually check solenoid valves to be sure they are actuating properly.
3. Stop ram at bottom the stroke, drain air from reservoir, then remove the end cap from the small end of the prefill valve by removing the four (4) cap screws. Pull the piston out and inspect spring. (Refer to prefill valve drawing). Also check "O" ring installed in the bore of the prefill valve while pilot piston is removed. Replace if there is a doubt about its condition. If worn, this "O" ring will allow pressure to bypass and the press will not develop any pressure.
4. With motor running and the ram in the up position, bleed air from the hydraulic system using the bleed valve on the top of the elbow directly above the cylinder. Any air trapped will either slow the pressure buildup, or not permit the press to build any pressure.
5. Check the prefill main poppet to be sure that the poppet is seated properly.

Ram Drifts Down When Motor is Shut Off, or Between Cycles:

A small amount of drift of the ram is expected and is of no concern. Frequent or rapid drift results from a loss of hydraulic seal. The ram is held in the up position by oil trapped in the bottom, (rod side), of the cylinder. The possible leakage points are:

1. through the bottom ram packing, which can be readily observed if it is leaking excessively;
2. through the piston head packing;
3. through the ram-down-by-gravity valve;
4. through the up-relief valve.

The last item named is virtually leak-proof, and may, in all probability, be ignored. It should only be checked after the first three items have been checked. Shutting off the down speed valve will indicate the condition of the ram-down-by-gravity valve. If drifting stops, it would indicate the ram-down-by-gravity valve needs further checking or replacing. Drift persistent after shutting off the down speed valve almost invariably indicates worn seals on the piston head of the cylinder. The piston must be pulled out of the top of the cylinder. The cylinder packing is generally good for several million cycles before replacement is necessary.

Note: Presses running on water glycol should be run at least 2 hours every week, or short seal life and component life will be experienced.

Ram Will Not Return When Hand Pulls Are Released:

Observe the system pressure gauge. If no pressure is seen on the gauge, the system relief or up relief valve may be operating improperly. Be sure both relief valves are clean and properly adjusted (see system relief and up stop relief sections of this manual). You may have a very sticky or dull die, and not have sufficient pull-out tonnage. Use two pry bars and try moving the ram up. Then align and/or sharpen the dies. If no pressure shows on the gauge when the hand pulls are released and the ram does not rise, check the ram up directional valve. It may be an electrical malfunction and the valve is centering instead of shifting. Push in the pin located in the center of the top solenoid. Also check the ram-down-by-gravity valve to see if it is closing properly. This may be checked by closing the downspeed valve. Be sure to open this valve again after checking. The down by gravity valve is a normally closed valve and de-energizes and closes when the hand pulls are released. The piston packing could also be worn, allowing the pressure to escape past the seals and back to the reservoir.

Note: If side core or unloader options are installed on the trim press, all limit switches pertaining to retracted positions must be made before any logic can continue.

Programmable Controller Not Functioning:

A sequence of operations has been included in this manual to help diagnose press problems. Refer to this sheet before any of the below solutions are attempted.

You can often locate serious problems by first making a thorough physical inspection. We recommend that you:

1. Make sure that the controller and all other devices in the system are securely mounted.
2. Check all wiring, including connections from the main disconnect to the controller input.
3. Measure incoming line voltage to be certain that it corresponds to controller requirements.

Energizing the Controller:

Upon energizing the controller, various LED's appear illuminated. The DC power and PC run light should be illuminated. If the PC run light is not illuminated, adjust the auto/manual switch located on the controller to the AUTO position. If the problem still exists, contact **KARD** Customer Service and Parts Department.

Testing Inputs:

If the status indicator on the processor fails to go ON when it should, check the following:

1. The input terminal power source.
2. The input circuit wiring.
3. The input device itself.

If the source of the problem is not found to be any of the above, the processor unit may need replacement. Contact **KARD** Customer Service and Parts Department.

Testing Outputs:

If the output terminal LED status indicator light does not go ON and the output device does not energize, check the inputs. If the terminal status indicator goes ON but the output device fails to operate, check the following:

1. The output terminal power source;
2. The output fuse;
3. The output circuit wiring;
4. The voltage at the output wiring terminals;

5. The output device itself.

If the source of the problem is not found by any of the above methods, the processor unit may need replacement. Contact **KARD** Customer Service and Parts Department.

Suggested Spare Parts

Mechanical:

- 1 ea.Spring - Prefill Valve Poppet
- 1 ea.Spring - Prefill Valve Pilot Piston
- 1 ea.Spring - Safety Ratchet

Electrical:

- 1 ea.Control Circuit Fuse
- 2 ea.Contact Block for Pushbuttons and Selector

Switches

- 1 ea.Proximity Switch for Ram Down

Hydraulic:

- 2 ea.Oil Filter Element
- 1 ea.Relief Valve
- 1 ea.Hydraulic Pump
- 1 ea.Motor Cooling
- 1 ea.Air Regulator
- 1 ea.Directional Valve
- 1 ea.Gage (0-60 PSI air pressure)
- 1 ea.Gage (0-3000 PSI hydraulic pressure)
- 1 ea.Pilot Pressure Check Valve
- 1 ea.Safety Ratchet Solenoid Air Valve
- 1 ea.Cylinder Packing Set
- 2 ea.Hydraulic Tank Cover O-Rings

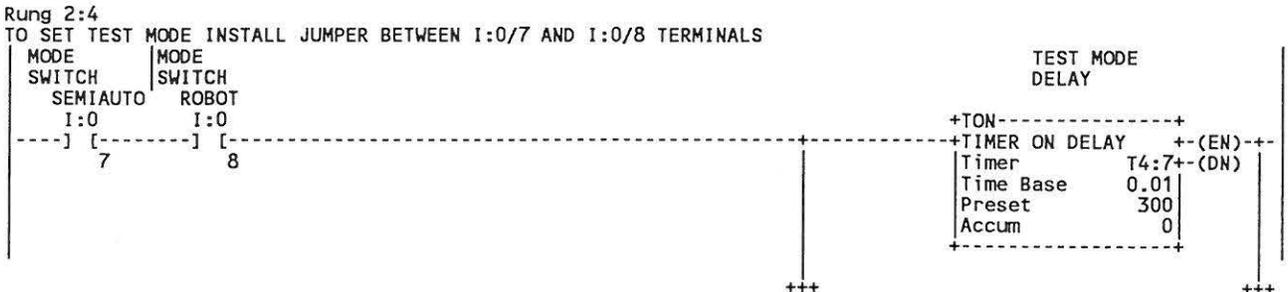
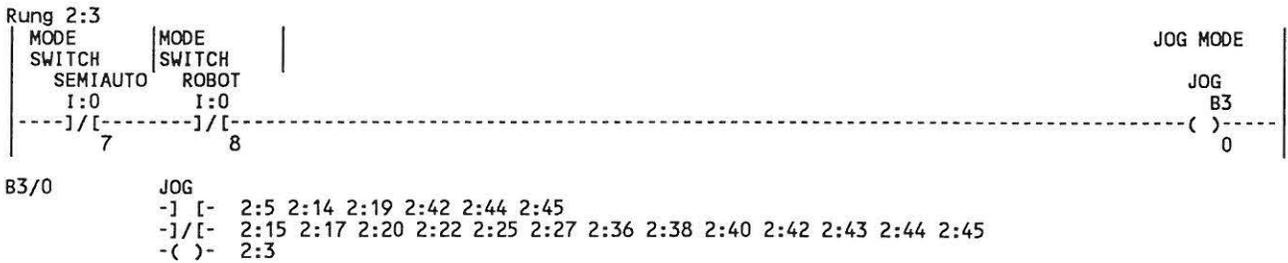
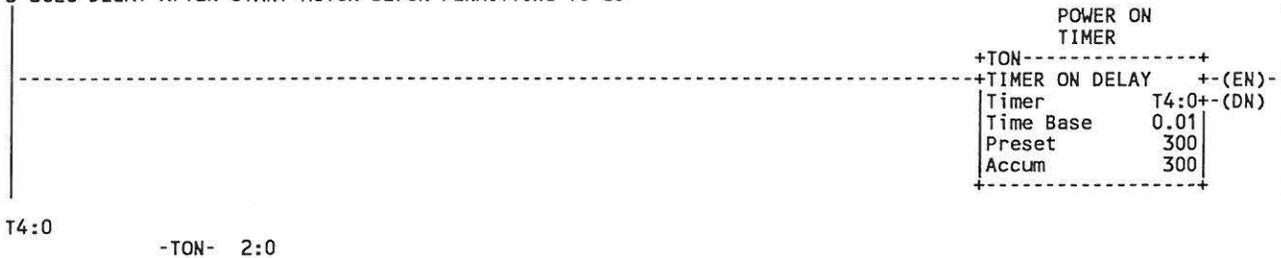
Please have trim press model number and serial number available when ordering spare parts.

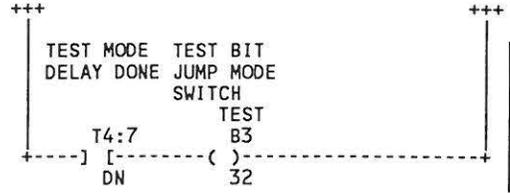
Rockwell Software Incorporated
9323 Series Software
APS Release 6.01
Documentation Utility
Program Listing

NATIONAL DIECASTING S06164

Processor File: S06164.ACH
June 18, 1997 - 10:57

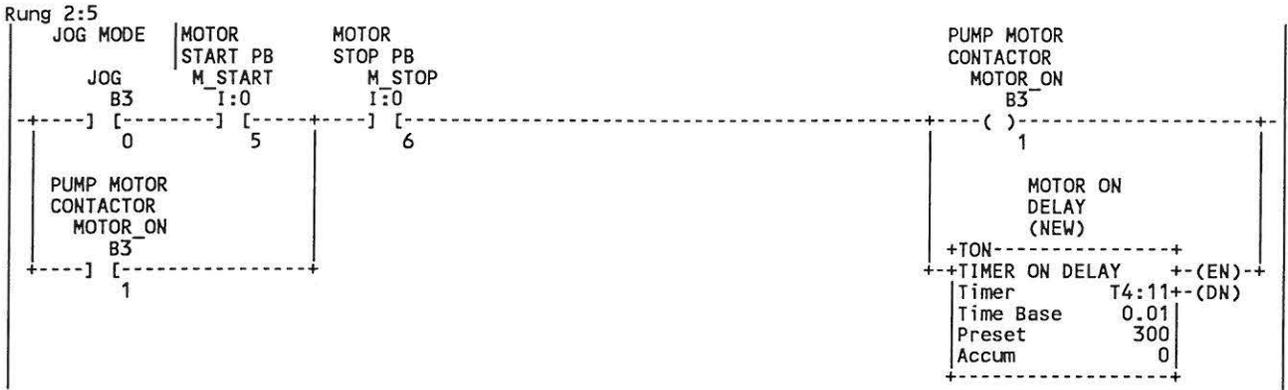
Rung 2:0
 PROTOTYPE PROGRAM - S05768
 MACHINE: ALL FUNCTIONS, MECHANICAL START BARS, NO LIGHT CURTAIN
 CHANGES: 1. UNTIDRIFT, 2 STOP IF TOUCH BARS WHEN GOING UP (RUNG 37)
 3 3SEC DELAY AFTER START MOTOR BEFOR PERMITTING TO GO





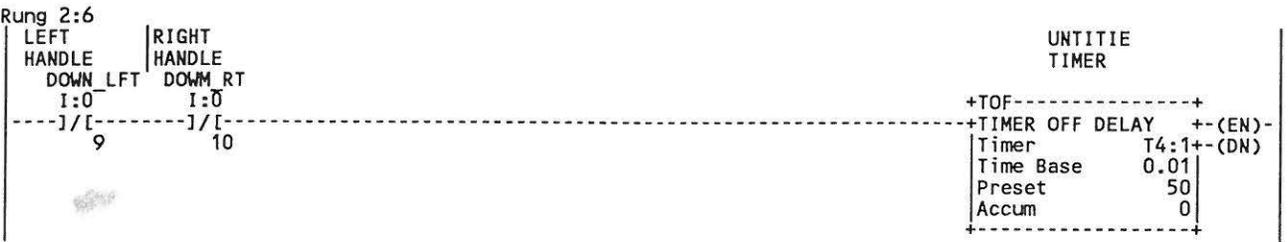
B3/32 TEST
 -] [- 2:12 2:12 2:13
 -]/[- 2:12 2:16 2:22 2:29
 -()- 2:4

T4:7
 -TON- 2:4



B3/1 MOTOR_ON
 -] [- 2:5 2:33
 -()- 2:5

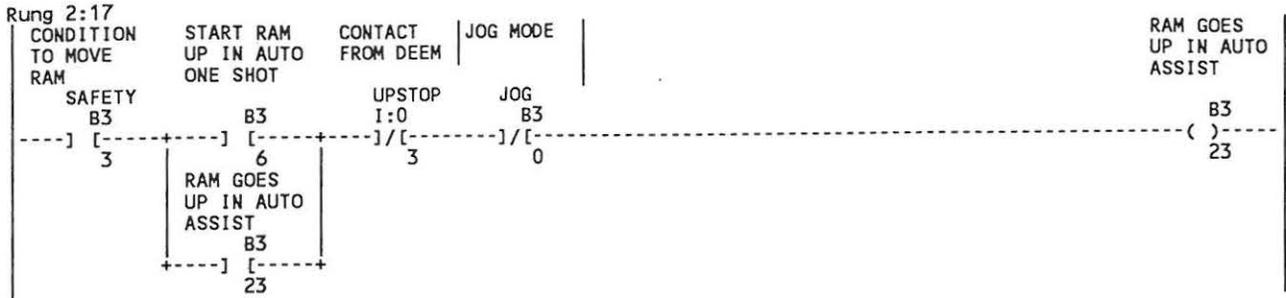
T4:11
 -TON- 2:5



T4:1
 -TOF- 2:6



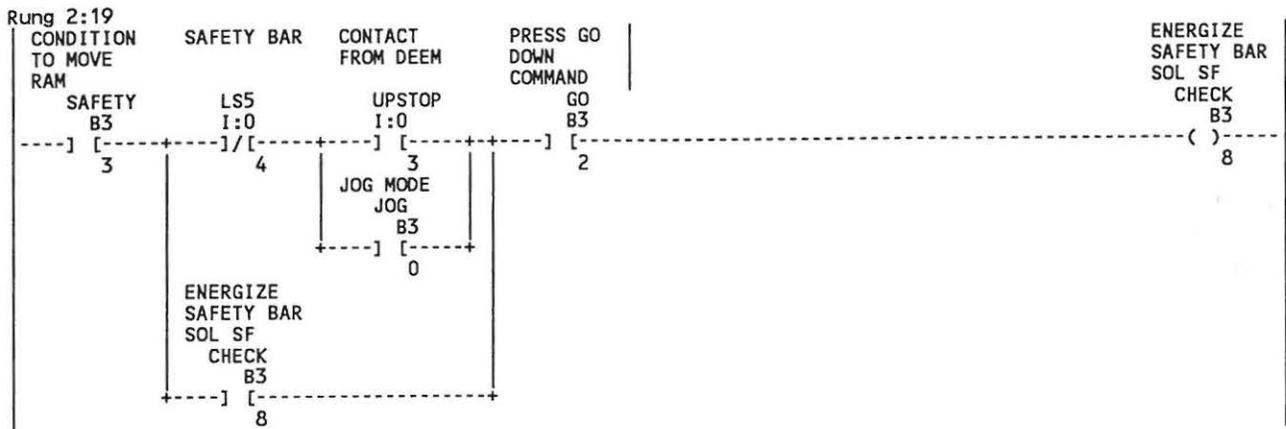
B3/25 ROBOTBAD
 -]/[- 2:10
 -(L)- 2:11
 -(U)- 2:7 2:9



B3/23
 -] [- 2:17 2:18 2:28
 -()- 2:17



B3/7
 -] [- 2:37 2:47
 -()- 2:18



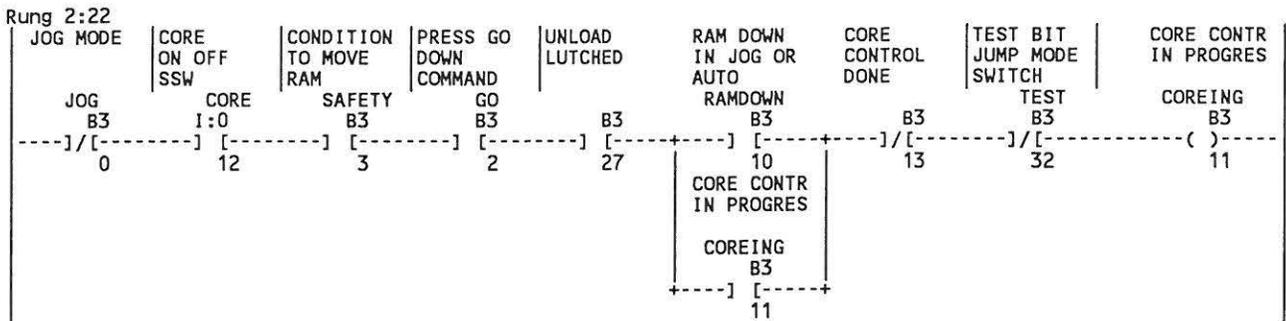
B3/8
 CHECK
 -] [- 2:19 2:21 2:39 2:40 2:41
 -()- 2:19



B3/9
 CANCEL
 -] [- 2:16
 -()- 2:20



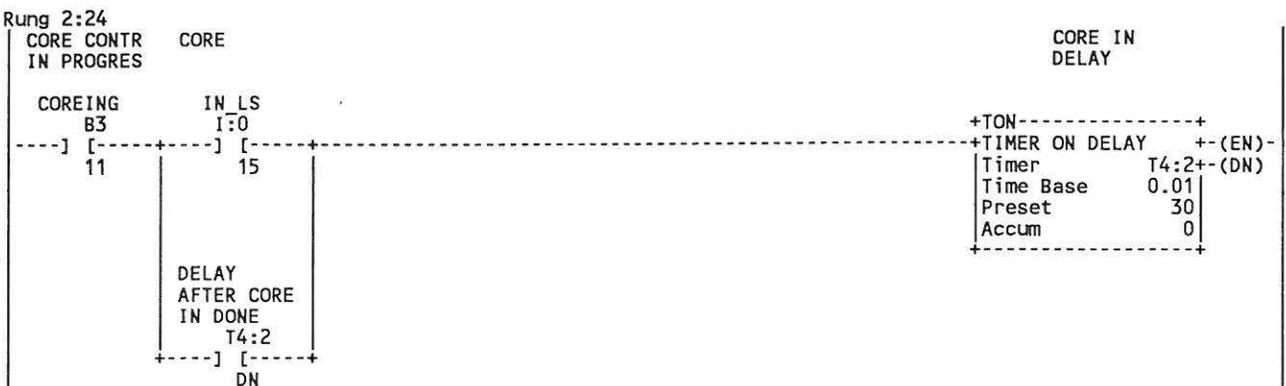
B3/10 RAMDOWN
 -] [- 2:20 2:22 2:27 2:38
 -()- 2:21



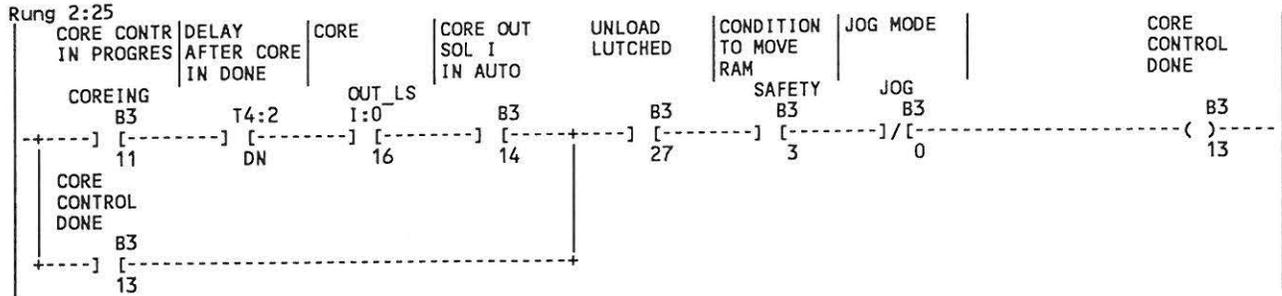
B3/11 COREING
 -] [- 2:13 2:22 2:23 2:24 2:25 2:26 2:38 2:43
 -] / [- 2:21
 -()- 2:22



B3/12
 -] [- 2:42
 -()- 2:23



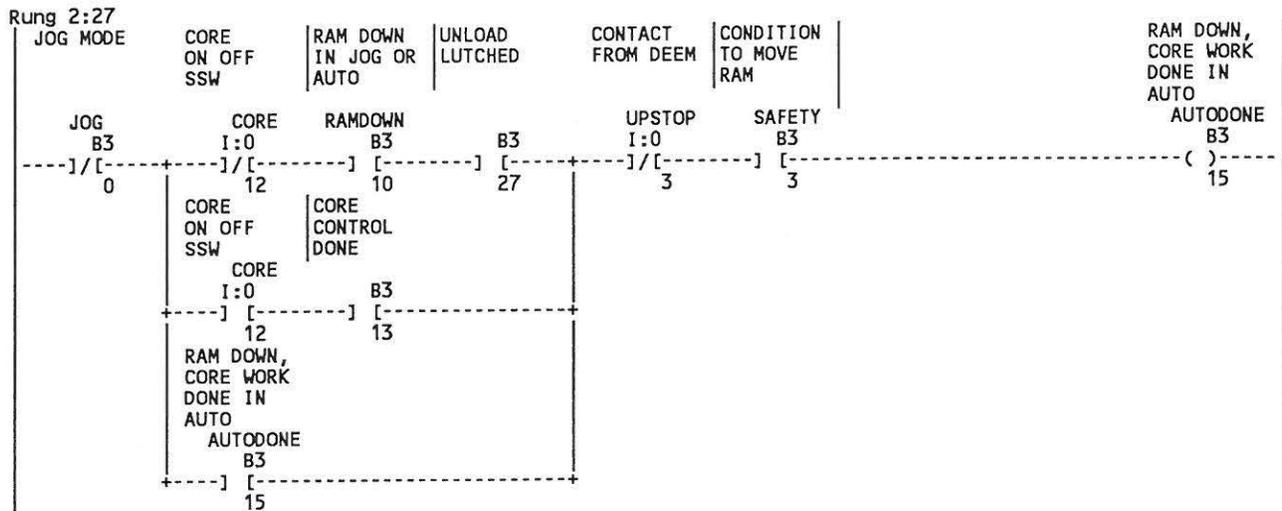
T4:2
 -TON- 2:24



B3/13
 -] [- 2:25 2:27
 -]/[- 2:22
 -()- 2:25



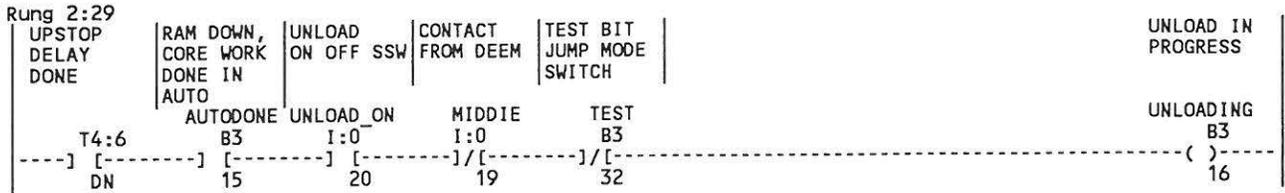
B3/14
 -] [- 2:25 2:44
 -()- 2:26



B3/15
 AUTODONE
 -] [- 2:16 2:27 2:29
 -]/[- 2:10
 -()- 2:27



T4:6
 -TOF- 2:28



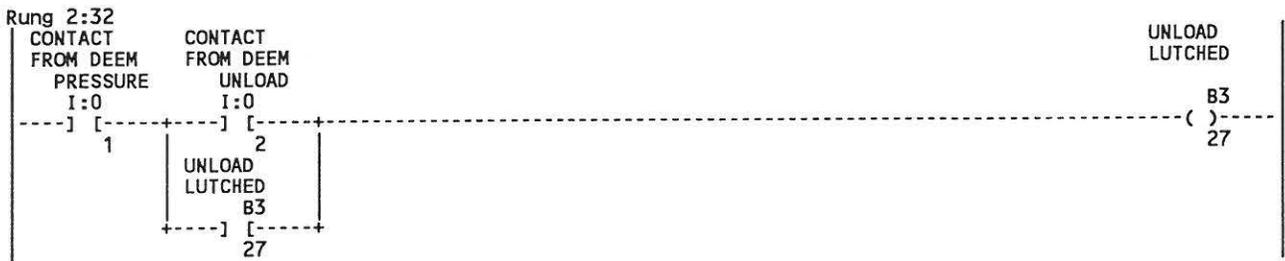
B3/16 UNLOADING
 -] [- 2:13 2:30 2:31
 -]/[- 2:18 2:37
 -()- 2:29



B3/17
 -] [- 2:45
 -()- 2:30



T4:3
 -TON- 2:31



B3/27
 -] [- 2:22 2:25 2:27 2:32
 -]/[- 2:38
 -()- 2:32



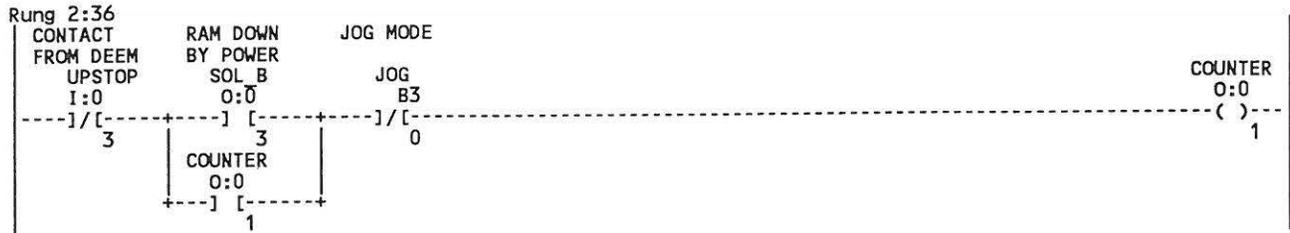
O:0/0 MOTOR
 -()- 2:33



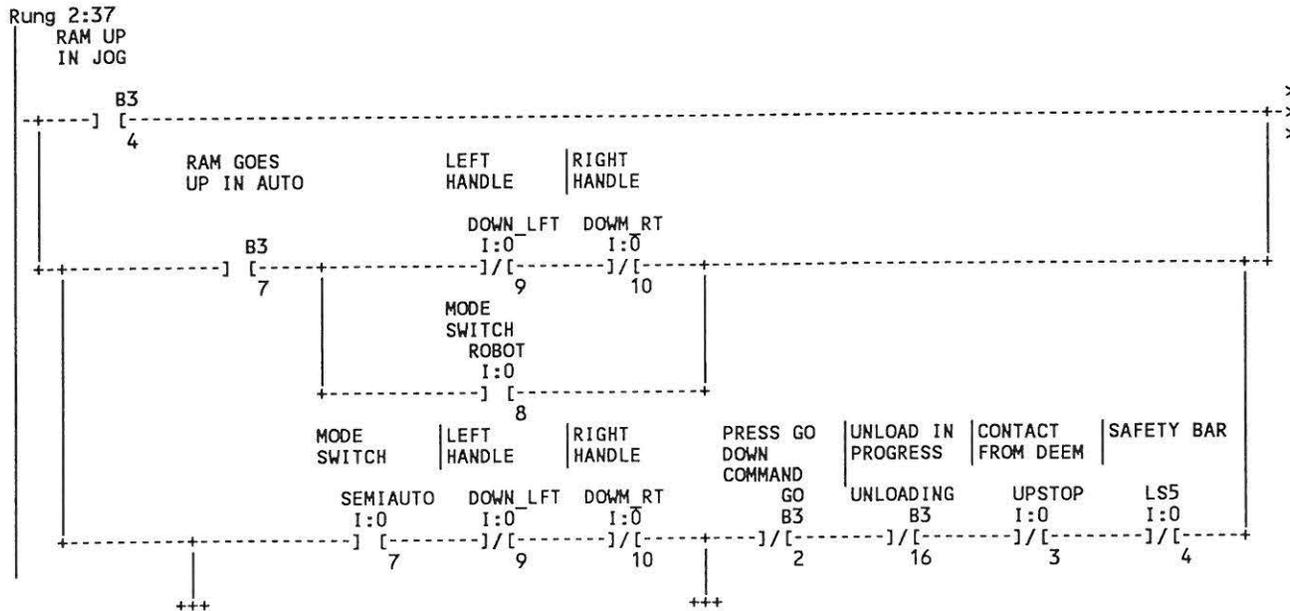
T4:4 -TON- 2:34



T4:5 -TON- 2:35

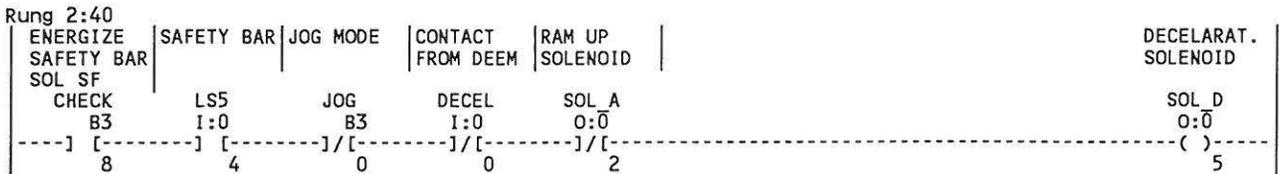


0:0/1 COUNTER
 -] [- 2:36
 -()- 2:36





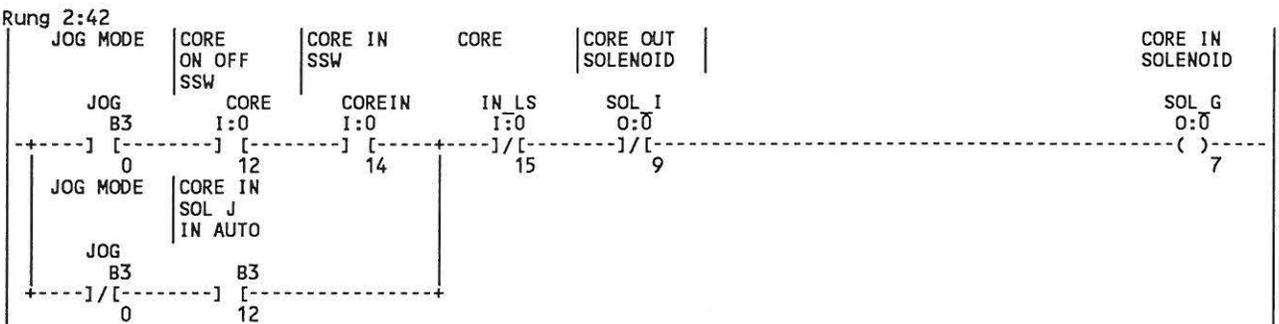
0:0/4 SOL_C
 -()- 2:39



0:0/5 SOL_D
 -()- 2:40



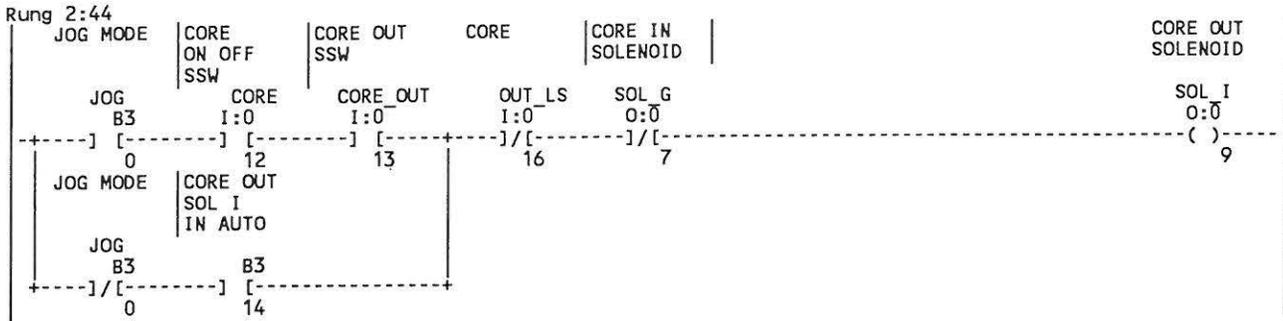
0:0/6 SOL_SF
 -()- 2:41



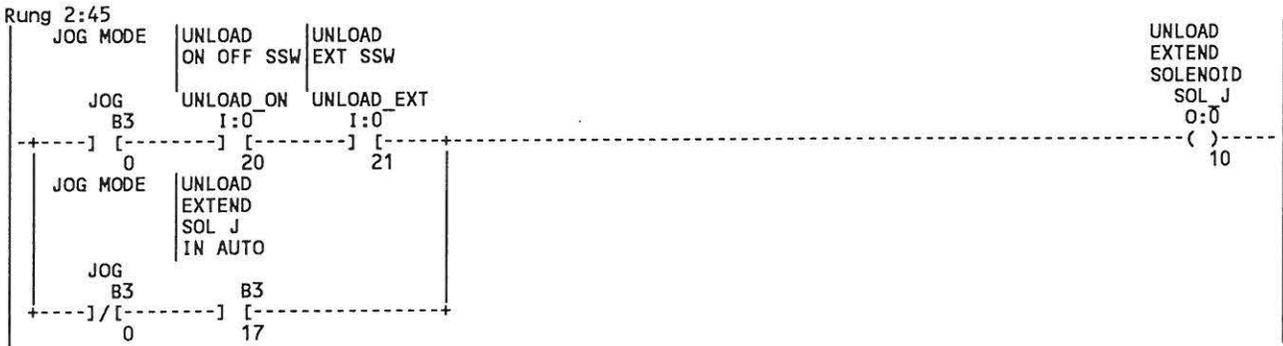
0:0/7 SOL_G
 -]/[- 2:44
 -()- 2:42



0:0/8 SOL_H
 -()- 2:43



0:0/9 SOL_I
 -] / [- 2:42
 - () - 2:44



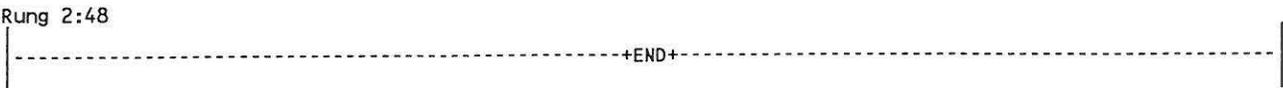
0:0/10 SOL_J
 - () - 2:45



0:0/11 PRESS
 -] / [- 2:10
 - () - 2:46



0:0/13 - () - 2:47



REPORT OPTIONS SUMMARY

Insure Valid X-Ref Info:	YES
Graphics Mode:	NO
Page Width:	110
Page Length:	90
Starting File:	2
Ending File:	2
Power Rail:	YES
Address Comments:	YES
Address Display:	SYMBOL
Rung Comments:	YES
Ladder Cross Reference:	OUTPUTS ONLY
Output Cross Reference:	NO